AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) In an arrangement with a plurality of nodes making up a multiple hop wireless communication network for routing data packets over transmission paths, a method for efficient routing in said multiple hop wireless communication network, said method comprising:

providing link status information to a link status monitor by acquiring link status quality between nodes in the network, the link status information being provided by one or both of an Open Systems Interconnection (OSI) ~~OSI~~ layer 2 ~~means~~ and an OSI layer 1 ~~means~~, wherein the link status information includes parameters that describe a time varying nature of radio channels of links between the nodes;

the link status monitor updating a routing element with said link status information;

the routing element predicting future link qualities of links in a chain between a source node and a destination node based on the updated link status information;

the routing element determining at least two possible routes with essentially similar link quality status for a data packet based on the predicted future link qualities of the links in the chain; and

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the routing element routing said data packet via the at least two determined routes.

2. (Previously presented) The method according to claim 1, further comprising combining said data packets at a destination node.

3. (Previously presented) The method according to claim 1 further comprising, a processing element replacing one of said data packets with parity bits for error detection and error correction purposes.

4. (Previously presented) The method according to claim 1, wherein said wireless link is a transmission system based on electromagnetic radiation with a frequency in the range of 100 kHz to 100 PHz.

5. (Previously presented) The method according to claim 4, wherein said transmission system is one or several of the following radio standards: IEEE 802.11, IEEE 802.15, IEEE 802.16 HiperLAN, HomeRF, Bluetooth, IR, UWB, JTRS, 3G, GPRS, and EDGE.

6. (Currently amended) A system for efficient routing in a communication network having a plurality of nodes, each node comprising:

link status acquiring means for acquiring information about link status between neighboring nodes, wherein the link status information includes parameters that describe a time varying nature of radio channels of links between the nodes;

updating means for updating routing means with said link status information;

determination means using said link status information for predicting future link qualities of links in a chain between a source node and a destination node and for determining at least two possible routes with essentially similar link quality status for routing of a data packet based on the predicted future link qualities of the links in the chain; and

routing means for routing said data packet via said at least two determined routes.

7. (Previously presented) A system according to claim 6, wherein communication between said nodes is wireless.

8. (Previously presented) A system according to claim 7, wherein the communication network is an ad hoc network.

9. (Previously presented) The system according to claim 6, further comprising replacing means for replacing one of said data packets with parity bits for error detection and error correction purposes.

10. (Previously presented) The system according to claim 7, wherein said wireless communication takes place over a transmission system based on electromagnetic radiation with a frequency in the range of 100 kHz to 100 PHz.

11. (Previously presented) The system according to claim 10, wherein said transmission system is one or several of the following radio standards: IEEE 802.11, IEEE 802.15, IEEE 802.16 HiperLAN, HomeRF, Bluetooth, IR, UWB, JTRS, 3G, GPRS, and EDGE.

12. (Currently amended) A node in a communication network having a plurality of nodes, said node comprising:

processing means for processing network control information;

storing means for storing network control information;

transmission means for transmitting data packets;

link status acquiring means for acquiring link information comprising link status and link quality between neighboring nodes, wherein the link status information includes parameters that describe a time varying nature of radio channels of links between the nodes;

determination means using acquired link information for predicting future link qualities of links in a chain between a source node and a destination node and for determining at least two routes with essentially similar link quality status to a destination for routing of a data packet based on the predicted future link qualities of the links in the chain; and

routing means for routing said data packets via said at least two determined routes.

13. (Previously presented) The node according to claim 12, wherein communication between nodes is wireless.

14. (Previously presented) The node according to claim 13, wherein said communication network is an ad hoc network.

15. (Previously presented) The node according to claim 12, further comprising replacing means for replacing one of said data packets with parity bits for error detection and error correction purposes.

16. (Previously presented) The node according to claim 12, wherein said wireless communication takes place over a transmission system based on electromagnetic radiation with a frequency in the range of 100 kHz to 100 PHz.

17. (Previously presented) The node according to claim 16, wherein said transmission system is one or several of the following radio standards: IEEE 802.11, IEEE 802.15, IEEE 802.16 HiperLAN, HomeRF, Bluetooth, IR, UWB, JTRS, 3G, GPRS, and EDGE.

18. (Previously presented) A wireless communication network comprising a system according to claim 6, comprising one or several nodes.

Claim 19 (Canceled)

20. (Currently amended) A method for routing a data packet in a multiple hop wireless network from a source node to a destination node, the method comprising:

the source node sending a route request (RREQ) to one or more neighbor nodes;

the source node receiving a route reply (RREP) message from at least one of the one or more neighbor nodes in response to the RREQ message;

the source node predicting future link status of at least one link in a chain between the source node and a destination node based on the RREP message, in which the RREP message includes link status information on one or more links in the chain, and in which the link status information of a link between two nodes in the chain includes <u>an Open Systems Interconnection</u>

(OSI) ~~OSI~~ layer 1 parameters and/or an OSI layer 2 parameters, wherein at least one parameter describes a time varying nature of radio channels of links between the nodes;

the source node determining one or more routes for the data packet based on the predicted future link status of the at least one link; and

the source node routing the data packet through the determined one or more routes.

21. (Previously presented) The method of claim 20,

wherein the OSI layer 1 parameters include any one or more of a signal strength, a signal-to-interference-noise (SIN) ratio, a signal strength variation speed, a SIN variation speed, an average fading duration, a Doppler spread, and a Doppler shift, and

wherein the OSI layer 2 parameters comprise any one or more of a number of ACKs over a predetermined period of time, a number of NACKs over a predetermined period of time, and a number of bit errors detected and/or corrected through forward error correction (FEC).

22. (Previously presented) The method of claim 20,

wherein the link status information of a link between two nodes comprise at least one long time range parameter and at least one short time range

parameter, in which a long time range covers several traffic frames and a short time range covers several transmitted symbols or bits,

wherein low and high values for the long time range parameter respectively indicate relatively poor and good link qualities,

wherein when the long time range parameter value is high, a low value for the short time range parameter indicates that the link is experiencing relatively bursty errors for a duration of time, and a high value for the short time range parameter indicates that the link is experiencing steady and random errors for the duration of time,

wherein when the long time range parameter value is low, the low value for the short time range parameter indicates that the link is relatively bursty and in good condition for the duration of time, and the high value for the short time range parameter indicates that the link is steady and in good condition for the duration of time,

wherein the step of predicting the future link status of the at least one link in the chain comprises any one or more of:

the source node predicting that a new route will arise when the short time range parameter is low and the long time range parameters goes from low to high;

the source node predicting that a current route will fade out when the short time range parameter is low and the long time range parameters goes from high to low;

the source node predicting that the new route will grow relatively slowly when the short time range parameter is high and the long time range parameters goes from low to high; and

the source node predicting that the current rout will disappear relatively slowly when the short time range parameter is high and the long time range parameters goes from high to low.

23. (Previously presented) The method of claim 22,

wherein the long time range parameter includes one or more of a signal strength, a SIN, a number of ACKs, and a number of NACKs, and a number of bit errors detected and/or corrected through forward error correction (FEC), and

wherein the short time range parameter includes one or more of a signal strength variation speed, a SIN variation speed, and a Doppler shift.

24. (Previously presented) The method of claim 20,

wherein the step of determining the one or more routes for the data packet comprises the source node determining at least two routes with substantially same link qualities, and

wherein the step of routing the data packet through the determined one or more routes comprises the source node routing the data packet to the at least two routes with substantially the same link qualities.

25. (Previously presented) The method of claim 24, wherein the step of routing the data packet through the determined one or more routes further comprises replacing at least one packet with parity bits prior to routing the replaced data packet.

26. (Previously presented) A method of claim 20, further comprising:

the source node receiving a route error (RERR) message from at least one of the one or more neighbor nodes in response to the RREQ message, wherein the RREQ message includes the link status information on the one or more links in the chain, the RREQ message also including a prediction of failure from at least one intermediate node of a link between the at least one intermediate node and a next hop; and

the source node determining the one or more routes for the data packet based on the RREQ message.

27. (Currently amended) A method for providing link status information of a link between two nodes of a multiple hop wireless network to enable routing of a data packet between source and destination nodes of the network, the method comprising:

a node receiving a route request (RREQ) message from a first neighbor node;

~~wherein the RERR message includes link status information of the link between the node and the first neighbor node,~~

the node predicting whether a link between the node and the first neighbor node is likely to fail in a near future, wherein in the prediction is a function of the link status informaton; and

the node sending a route error (RERR) message to the first neighbor node when it determines that the link is likely to fail,

~~wherein the RERR message includes link status information of the link between the node and the first neighbor node,~~ and

wherein the link status information of the link includes ~~OSI~~ an Open Systems Interconnection (OSI) layer 1 parameters and/or an OSI layer 2 parameters, wherein at least one parameter describes a time varying nature of radio channels of links between the nodes.

28. (Previously presented) The method of claim 27,

wherein the OSI layer 1 parameters include any one or more of a signal strength, a signal-to-interference-noise (SIN) ratio, a signal strength variation speed, a SIN variation speed, an average fading duration, a Doppler spread, and a Doppler shift, and

wherein the OSI layer 2 parameters comprise any one or more of a number of ACKs over a predetermined period of time, a number of NACKs over

a predetermined period of time, and a number of bit errors detected and/or corrected through forward error correction (FEC).

29. (Previously presented) The method of claim 27,

wherein the link status information of the link comprise at least one long time range parameter and at least one short time range parameter, in which a long time range covers several traffic frames and a short time range covers several transmitted symbols or bits,

wherein low and high values for the long time range parameter respectively indicate relatively poor and good link qualities,

wherein when the long time range parameter value is high, a low value for the short time range parameter indicates that the link is experiencing relatively bursty errors for a duration of time, and a high value for the short time range parameter indicates that the link is experiencing steady and random errors for the duration of time,

wherein when the long time range parameter value is low, the low value for the short time range parameter indicates that the link is relatively bursty and in good condition for the duration of time, and the high value for the short time range parameter indicates that the link is steady and in good condition for the duration of time,

wherein the step of predicting whether the link is likely to fail comprises any one or more of:

the node predicting that a new route will arise when the short time range parameter is low and the long time range parameters goes from low to high;

the node predicting that a current route will fade out when the short time range parameter is low and the long time range parameters goes from high to low;

the node predicting that the new route will grow relatively slowly when the short time range parameter is high and the long time range parameters goes from low to high; and

the node predicting that the current rout will disappear relatively slowly when the short time range parameter is high and the long time range parameters goes from high to low.

30. (Previously presented) The method of claim 29,

wherein the long time range parameter includes one or more of a signal strength, a SIN, a number of ACKs, and a number of NACKs, and a number of bit errors detected and/or corrected through forward error correction (FEC), and

wherein the short time range parameter includes one or more of a signal strength variation speed, a SIN variation speed, and a Doppler shift.

31. (Previously presented) The method of claim 27, further comprising:

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the node determining whether it is a destination node of the RREQ message;

the node forwarding the RREQ message to a second neighbor node when it is determined that the node is not the destination node;

the node receiving either a route reply (RREP) message or the RERR message from the second neighbor node in response to the RREQ message, in which when the RERR message is received, the RERR message includes a prediction of a failure of at least one link in a chain between the node and the destination node; and

the node forwarding the received RREP or the RERR message to the first neighbor node.

32. (Previously presented) The method of claim 31, further comprising the node modifying RREP or the RERR message to include the status link information of the link between the node and the first node prior to forwarding the RREP or the RERR message.